Pest Alert

United States
Department of Agriculture

Forest Service

Northeastern Area
NA-PR-03-00

Hemlock Borer

The hemlock borer, *Melanophila fulvoguttata* (Harris), is a pest of eastern hemlock, *Tsuga canadensis* (L.) Carr., throughout its natural range. Although normally considered a secondary pest and seldom abundant, the borer can develop to outbreak conditions following wind-throw, drought, excessive stand openings, or attacks by other primary pests such as the hemlock woolly adelgid (*Adelges tsugae*) or hemlock loopers (*Lambdina* spp.).

Hosts: Although its principal host is eastern hemlock, the hemlock borer also attacks Carolina hemlock (*Tsuga caroliniana*), a southern Appalachian species of hemlock, eastern white pine (*Pinus strobus*), tamarack (*Larix laricina*), balsam fir (*Abies balsamea*), red spruce (*Picea rubens*), white spruce (*P. glauca*), and black spruce (*P. mariana*).

Photo 1. Hemlock borer adult.

Description: The adult (Photo 1) is a black, somewhat flattened beetle with a metallic sheen and about 10 mm long. Its width at the base of the wing cover is about 3 mm. Each wing cover usually has three yellowish spots, though specimens vary, and some may have one to four spots.

In the larva (Photo 2), as with most flatheaded borers, the second thoracic segment is wider than the head and body segments. The mature larva is translucent white and about 2.5 cm long. The pupa is often white in the early stages, but gradually turns black—the color of the adult. The egg is white and slightly oval and about 0.8 mm long.

Photo 2. Hemlock borer larva.

Life History: Adult beetles are active primarily from May through August, but localized weather and microclimatic conditions can affect beetle activity. In warmer, more open stands, peak emergence is in June; while in cooler, dense stands, peak emergence is in July or early August. Adult beetles may live as long as 2 weeks. Females lay groups of eggs in bark crevices of weakened, dead or dying trees, or logs in which the cambium is still moist. Eggs usually hatch within a week.

Development from egg to adult may take 1 to 2 years. A mature larva needs exposure to winter temperatures before pupating. From eggs laid in June, larvae mature in late summer, overwinter in a pre-pupal chamber in the outer bark, and pupate the following spring. From eggs laid during July or August, immature larvae overwinter in the inner bark, mature in the second summer, spend the second winter in the outer bark, and pupate the following spring.

Evidence of Attack: Small oval holes in the bark, about 3 mm in diameter, indicate that development is complete and beetles have emerged. Larval galleries (Photo 3) can be found on the surface of the sapwood by removing the bark.

When borer populations are heavy, the outer bark is frequently chipped away by woodpeckers searching for larvae (Photo 4), leaving the reddish surface of the inner bark exposed (Photo 5). Piles of bark chips are often found around the base of trees (Photo 6).

Photo 3. Galleries formed by hemlock borer larvae.

Photo 4. Initial sign of woodpeckers searching for larvae.

Photo 5. Exposed reddish inner-bark as a result of frequent chipping of outer-bark by woodpeckers.

Photo 6. Bark chips at base of tree.

Photo 7. Multiple hemlock trees attacked by hemlock borer resulting in heavy woodpecker activity.

Control: Hemlock borer outbreaks normally occur after other stresses have weakened the trees. Maintaining healthy trees is the best means of minimizing hemlock borer infestations. For example, hemlocks have shallow roots and are susceptible to droughty conditions, so ornamental trees should be watered in dry years. Also, damage from pests like hemlock woolly adelgid, scale insects, and loopers should be controlled to maintain healthy, vigorously growing trees. In forests, declining hemlocks should be salvaged to prevent buildup of borer populations. When removal of dead and dying trees is not possible, felling and removal of the bark to speed drying will reduce successful attacks by eliminating the host conditions necessary for larval development.

Photo Credits: Ron Kelley, Vermont Dept. of Forests, Parks and Recreation **Rich Evans, USDI National Park Service**

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